April/May 2000

AROUND DOE

Propulsion center named DOE national user facility

The Advanced Propulsion Technology Center at the Department of Energy's Oak Ridge National Laboratory (ORNL) has been designated a DOE national user facility. The center specializes in the detailed characterization of internal combustion engine emissions and efficiency and performs work for the Department's Office of Energy Efficiency and Renewable Energy, other Federal agencies, and outside institutions upon DOE approval.

The facility's comprehensive capabilities include tabletop engine exhaust simulators, single and multicylinder engines, and full vehicles. Special diagnostic and measurement tools aid in development and evaluation of engine and emission control technology.

The center is one of 17 user facilities available to researchers inside and outside ORNL. The user facilities encourage collaborative efforts between the laboratory and the private sector. ORNL's Office of Science and Technology Partnerships, 865-576-4221, coordinates these efforts.

Additional information about the Advanced Propulsion Technology Center and current ORNL research and development projects is available at **http://www.ornl.gov**.

LANL library receives information award

The Research Library at the Department of Energy's Los Alamos National Laboratory has received the 1999 Information Center of the Year Award from the Library of Congress' Federal Library and Information Center Committee. The library was selected for the award from more than 1,200 Federal libraries and information centers.

"This is tremendous external recognition of the outstanding progress and impact the Research Library and Library Without Walls project has achieved during the past few years," said Rick Luce, Research Library Director. The Library Without Walls project allows researchers to access a wealth of digital information sources worldwide, anytime, anywhere. More information is available at **http://lib-www.lanl.gov/lww/welcome.html**.

Fuel cell power system installed at Brookhaven

On March 31, 2000, Secretary of Energy Bill Richardson joined state and local officials to dedicate an advanced fuel cell power system installed at the Department of Energy's Brookhaven National Laboratory (BNL), Upton, N.Y. The system will be tested as part of the Department's strategic effort to make fuel cells a viable power-generation option in partnership with the Long Island Power Authority; Plug Power, Latham, N.Y.; and the New York Energy Research and Development Agency.

"Power supply disruptions experienced last summer in several regions of the country, including Long Island, illustrate the importance of fuel cell technology in providing consumers a reliable source of clean, abundant and locally produced energy," said Secretary Richardson.

The three state-of-the-art seven-kilowatt fuel cells are among the first to be installed for testing on Long Island. Other sites include the U.S. Merchant Marine Academy at Kings Point, Hofstra University, and the State University of New York at Stony Brook. If the fuel cells fulfill their potential, just one would be able to meet the electricity and hot water needs of the average Long Island home. ❖

United States
Department of Energy (PA-40)
Washington, DC 20585

Official Business

Milestones

YEARS OF SERVICE

April 2000

Headquarters

Chief Financial Officer - Miriam G. Kurtyka (30 years), James R. Sweeney II (25). **EIA** - Jon A. Rasmussen (25), Ingrid Springer (25). **Energy Efficiency** - N. Michael Voorhies (35). **Envir. Management** - Robert A. Perrygo (30), David A. Erdman (25). **Fossil Energy** - Clifford F. Duchaine, Jr. (30), George Rudins (25). **General Counsel** - Michael P. Hoffman (25). **Inspector General** - Joseph Terzini (40).

International Affairs - Catherine M. Brantley (35). **Management & Administration** - James W. Brown, Jr. (30), Mayleen B. Jones (30), Raymond I. Velez (30). **Nuclear Energy** - Howard Huie (30). **Radioactive Waste** - Bertel R. Johnson, Jr. (30). **Science** - Mary J. Martin (30). **Security & Emergency Operations** - Lois E . Todd (35), Joseph V. Hawkins (30), Roger D. Parish (30). **Worker & Community Transition** - Patty L. S. Parizzi (35).

Field

Albany Research Center - Stephen T. Anderson (25). **Albuquerque/NNSA** - Rush O. Inlow (30), Ronald B. O'Dowd (30), Robert E. Burton (25), Brenda F. Crain (25), Christine A. McWhorter (25), Elizabeth S. Romero (25). **Chicago** - Robert Z. Leifer (25). **Golden** - Victor V. Candelaria (25). **Idaho** - R. Jeffrey Hoyles (30). **National ETL** - Charles H. Seehorn (30), Rand F. Batchelder (25), Virginia P. Odoski (25).

Nevada/NNSA - Don M. Wrathall (35), Joanne M. Walker (25). **Oak Ridge** - Wilson C. Carnes, Jr. (35). **Oakland** - Frank J. Kernan (30), John S. Muhlestein (30), Janet L. Rego (30). **Richland** - Richard R. McNulty (25). **Rocky Flats** - Gary W. Schuetz (30). **Savannah River** - Earline H. Broaden (25), Charles A. Hansen (25).

Savannah River/NNSA - Joseph M. Newell (25). **Southwestern Power** - Sharren S. Ripley (30), Cynthia D. Peck (25). **Western Area Power** - Connie C. Hilzendeger (30), Sandra G. Roth (30). **Yucca Mountain** - Birdie V. Hamilton-Ray (30), Jorge C. De La Garza (25), Claudia M. Newbury (25).

May 2000

Headquarters

Office of the Secretary - Carolyn J. Wallace (35). **Chief Financial Officer** - Thomas W. DeHanas (30), Debbie L. Kemp (25). **Energy Efficiency** - John D. Kern (30). **Envir., Safety & Health** - Thomas A. Rollow (25). **Fossil Energy** - Dorothy E. Fowlkes (35), David J. Beecy (25). **General Counsel** - Loy W. Kirkpatrick (45). **Inspector General** - Judith D. Gibson (30).

Management & Administration - Melvin S. Johnson (35), David Sholtz (35), Gary E. Kimmel (25), Michael B. Raizen (25), Peter A. Richards (25). **NNSA** - Mary A. Herring (25), Stephen J. Rodgers (25). **Nuclear Energy** - Frank A. Ross (35). **Radioactive Waste** - Leroy Stewart (25). **Science** - Betsy P. Goodman (25).

Field

Albany Research Center - Jimmy D. Wells (25). **Albuquerque/NNSA** - Diana K. Deese (30), Leo M. Pate (30), Carolyn B. Rodriguez (25). **Chicago** - Mellody L. Anderson (25), Joan L. Blaine (25), Kristine A. Winiarski (25). **National ETL** - Karan K. Graham (35), Larry A. Bissett (25), William C. Smith (25), John E. Sourbeer (25), Larry D. Strickland (25), Glenn E. Trentham (25). **Naval Pet. Reserves CO/UT/WY** - Donald V. Ross (25).

Oak Ridge - H. Randall Persinger (25), Donald K. Wierwille (25), Jerry E. Wills (25). **Oakland** - John P. Zilius (30), Chester Chang (25). **Oakland/NNSA** - Harvey D. Grasso (25). **Richland** - David T. Evans (25), Sally A. Sieracki (25), Quentin J. Stanko (25). **Rocky Flats** - Alfred E. Bell (25), Kent T. Brakken (25), Thomas E. Lukow (25), Laurence P. Maghrak (25). **Savannah River** - Mildred A. Keith (30), William Gilyard III (25), Judy O. Hicks (25), Ronald D. Simpson (25), John F. Smalley (25).

Savannah River/NNSA - David M. Whetsell (30). **Southwestern Power** - Darrell E. Gilliam (25). **Strategic Pet. Reserve** - William C. Gibson, Jr. (25), Patricia R. Johnson (25). **Western Area Power** - Bohdan M. Chopko (30), Edward F. Craig, Jr. (30), Karen R. Tallha (30), Ronald R. Brown (25), Douglas M. Hellekson (25), Steven L. Hiedeman (25), Peter H. Kinney (25).

RETIREMENTS

March 2000

Headquarters

Envir. Management - Donald Donaldson (8 years). **Science** - Theodore Vojnovich (12).

Field

Oak Ridge - Steven D. Richardson (27). **Savannah River** - Frank R. McCoy III (29). **Western Area Power** - Hugh R. Stephens (37).

April 2000

Headquarters

Energy Efficiency - Diane B. Pirkey (30). **NNSA** - Daniel F. Giessing (36), Nicholas Grossman (43), George B. Stevenson (38). **Policy** - Gay I. Leslie (20). **Radioactive Waste** - Dwight E. Shelor (24). **Security & Emergency Operations** - James L. Ford (8).

Field

Albuquerque/NNSA - Fred K. Ballew, Jr. (14), Louis A. Lucero (16). **Oakland** - Joan C. Macrusky (27). **Oakland/NNSA** - Donald M. Wilhelm (29). **Savannah River** - Perry E. Dukes (25). ❖

People IN ENERGY

Dr. Lura J. Powell is the new Director of the Department of Energy's Pacific Northwest National Laboratory. Powell previously served as Director of the Advanced Technology Program for the National Institute of Standards and Technology (NIST) in Gaithersburg, Md. She was with NIST for 28 years and was widely acclaimed for her guidance of the Advanced Technology Program. In addition, she has operated her own technology consulting business.

Secretary of Energy Bill Richardson has named **Camille Yuan-Soo Hoo** as the new Manager of the Department of Energy's Oakland Operations Office. Most recently, she was Chief Financial Officer and Business Manager for the Oakland Office. Yuan-Soo Hoo replaces **James M. Turner**, who will become the Assistant Deputy Administrator for International Nuclear Safety and Cooperation in the Department's National Nuclear Security Administration (NNSA). Turner replaces **Terry R. Lash**, who has been named a Senior Advisor on Ukrainian nonproliferation programs to Rose Gottemoeller, NNSA Acting Deputy Administrator for Defense Nuclear Nonproliferation.

Daniel Branagan, an engineer/scientist at the Department of Energy's Idaho National Engineering and Environmental Laboratory, has been recognized by The Metallurgical Society (TMS) as a 1999 "TMS Young Leader" in its Young Leaders Intern program. One of only nine winners who represent the best of young researchers in the materials field, Branagan was selected in the "Electronic, Magnetic and Photonic Materials Division."

J. Eun Moredock is the new Chief Information Officer at the Department of Energy's Western Area Power Administration. Most recently, Moredock was Chief, Metrics Program Office, Defense Information Systems Agency–Western Hemisphere. Previously, she served as Chief of Technical Support and Data Systems for the Office of Civilian Health and Medical Program for the Uniformed Services at the Department of Defense.

Jean Futrell, Director of the William R. Wiley Environmental Molecular Sciences Laboratory at the Department of Energy's Pacific Northwest National Laboratory, has received the Erwin Schrödinger Gold Medal. Futrell was recognized for his lifetime achievements in the field of mass spectrometry, especially applications for ion-molecule reactions. The award, named in honor of Austrian physicist Erwin Schrödinger, is sponsored by the biennial Symposium on Atomic and Surface Physics.

The Department of Energy's Brookhaven National Laboratory recently presented its Science & Technology Award to six staff members in recognition of their distinguished contributions to the laboratory's science and technology mission. The honorees are **David Cox** and **Laurence Littenberg**, Physics Department; **Marshall Newton**, Chemistry Department; **Lonny Berman**, National Synchrotron Light Source Department; and **Malcolm Capel** and **Robert Sweet**, Biology Department.

Wai-Kwong Kwok, a physicist in the Materials Science Division at the Department of Energy's Argonne National Laboratory, has been elected a Fellow of the American Physical Society for his pioneering studies of superconductors. Kwok's research centers on magnetic vortex dynamics and phase transitions in high-temperature and exotic superconductors—materials that can conduct electricity without resistance. Kwok has worked at Argonne since 1987.

Anna Beard-Taylor and **June Ollero** have been named "Women of Achievement" for the year 2000 by the Department of Energy's Richland Operations Office and Office of River Protection. The awards were presented in March during National Women's History Month. Beard-Taylor is a mechanical engineer in Richland's Office of Site Services. Ollero is director of Richland's Office of Training Services and Asset Reutilization.

Amit Goyal, a researcher in the Superconductivity Technology Program at the Department of Energy's Oak Ridge National Laboratory, has been named by the *MIT Technology Review* as one of the top 100 innovators for the next millennium. The award recognizes those who have the most potential to make significant technological innovations in the 21st century. Goyal's contributions are his work and inventions in the area of high-temperature superconductors.

John Herrick, Chief Counsel at the Department of Energy's Golden Field office, has been appointed an adjunct professor at the University of Denver Law School. Starting this fall, Herrick will be teaching a class on renewable energy law and project finance, the only such class of its kind taught in the country.

Ted Saito, a program leader in the Engineering Directorate at the Department of Energy's Lawrence Livermore National Laboratory, has been elected the year 2000 chair of the American Association of Engineering Societies (AAES). Saito was a member of the AAES board in 1999 and previously served as President of the International Society for Optical Engineering.

Brendan Kirby has been named Director, Power Systems and Energy Policy Studies, at the Buildings Technology Center at the Department of Energy's Oak Ridge National Laboratory. Kirby will manage the power system technology program. The center, a national user facility, is the premier United States research facility devoted to the development of technologies that improve energy efficiency and environmental compatibility of residential and commercial buildings.

Charles Neumeyer, lead project engineer for the National Spherical Torus Experiment (NSTX) at the Department of Energy's Princeton Plasma Physics Laboratory, has been named "Engineer of the Year" by the Professional Engineering Society of Mercer County (New Jersey). The group recognized Neumeyer's achievements with the NSTX and his distinguished career in fundamental research dealing with multiple technologies. ❖

Technique identifies bacterial DNA fingerprints

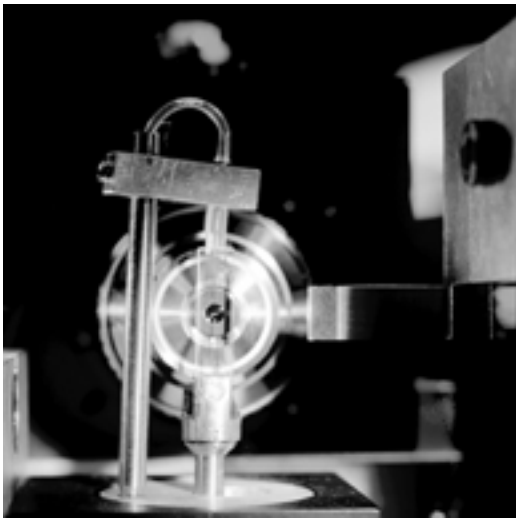
Researchers at the Department of Energy's Los Alamos National Laboratory have developed a desktop-sized instrument that rapidly identifies the DNA fingerprints of bacteria, including biological threat agents. The new ultrasensitive flow cytometer is 100 times faster and 200,000 times more sensitive than conventional gel electrophoresis at analyzing DNA samples. And the process requires only minute quantities of DNA to obtain a reliable result.

Researchers currently use pulsed-field gel electrophoresis to separate large DNA fragments according to size. Although sizes can be determined with 90 percent accuracy, relatively large amounts of DNA—about one-millionth of a gram—are required and it takes 14 to 24 hours to obtain a fingerprint from a prepared sample.

The new flow cytometer determines the fingerprint of DNA fragments with 98 percent or better accuracy in less than seven minutes from a prepared sample, regardless of the length of the fragments. Less than two-trillionths of a gram of DNA is required to perform the analysis.

First developed at Los Alamos more than 30 years ago, flow cytometers use lasers to analyze, characterize and sort thousands of biological cells, chromosomes, or molecules in minutes. Applications include analysis of white blood cells, DNA, RNA, and other biological functions.

In the new process, DNA fragments purified from bacterial cells are stained with a fluorescent dye that is directly proportional to the fragments' sizes. The stained fragments are passed through the flow cytometer. As a laser strikes the fluorescent dye molecules, a photon "burst" occurs. The cytometer counts the photons in a burst to obtain an accurate fragment size measurement. The resulting distribution of fragment sizes in the sample is its DNA fingerprint. The researchers then compare the fingerprint to those from a Los Alamos-developed database to identify the pathogen.



The new flow cytometer developed by Los Alamos National Laboratory.

The new flow cytometer has potential applications beyond defense and counter-bioterrorism, according to project leader James Jett of Los Alamos' Bioscience Division. In the food industry, for example, it could be used to detect the presence of salmonella and other bacteria. Public health and medical diagnostic workers could use the flow cytometer to analyze outbreaks of E.coli, staph, and other infectious diseases. The instrument also could aid in studies of the human genome.

The researchers are developing a smaller, portable version of the tool and seeking an industrial partner to manufacture it. A patent has been granted. ❖

Research DIGEST

A "natural" alternative to cleaning up uranium-contaminated sites is being studied by scientists at the Department of Energy's **Sandia National Laboratories**. Called natural attenuation, the method relies on a naturally occurring process that adsorbs soluble uranium and metals onto a mineral surface. As the coatings age and recrystallize, the uranium eventually becomes encased in the mineral and cannot escape into groundwater or soil. "This is an innovative approach to uranium cleanup," says Sandia scientist Malcolm Siegel. "Natural attenuation has become an accepted method for cleaning up soils and groundwater contaminated with toxins that can be eliminated through biological processes, where microorganisms break down organic contaminants. Here, instead, the uranium becomes strongly bound to the mineral naturally." If natural attenuation is found to be a viable option for cleaning up hazardous waste sites, the expense of cleanup could be significantly reduced. (Chris Burroughs, 505-844-0948)

❖

Michael Seibert, Maria Ghirardi, and Marc Forestier of the Department of Energy's **National Renewable Energy Laboratory** and scientists from the University of California at Berkeley have discovered a method for producing significant quantities of hydrogen gas using green algae. After allowing algae to grow under normal conditions, the researchers deprived them of sulfur, causing the algae to switch to an alternate metabolism that generates hydrogen but not oxygen. "Engineering advances for hydrogen storage, transportation and utilization are beginning to make the fuel feasible to power automobiles and buses and to generate electricity in this country," says Seibert. "What has been lacking is a renewable source of hydrogen." Currently, hydrogen fuel is extracted from natural gas, a non-renewable energy source. The new discovery makes it possible to harness nature's own tool, photosynthesis, to produce the promising alternative fuel from sunlight and water. (Julia Thomas, 303-275-3023) ❖

Education NOTES

Higher education institutions around the country can receive excess research equipment from the Department of Energy's **Los Alamos National Laboratory** (LANL) under a new Laboratory Education Equipment Gift Program. The equipment includes computers, computer accessories, photographic equipment, communication equipment, measuring tools, and special industrial and metal-working machinery. The program complements the laboratory's participation in existing educational support efforts, including the Department's current Energy Related Laboratory Equipment Program and equipment donation to elementary and high schools. Los Alamos' Education Program Office will facilitate the review process for proposals submitted under the new program. For more information, contact Dolores Jacobs, LANL, 505-665-9206.

In conjunction with the Department of Energy's book drive initiative, the Department's **Golden Field Office**, **Denver Regional Office**, and **National Renewable Energy Laboratory** collected and delivered 1,754 books to two Denver, Colo., schools on March 2 in honor of Dr. Seuss' birthday. Volunteers also visited the schools that day and read to students. Columbine Elementary and Lake Middle School will use the books in their libraries and classrooms, and some will be given to students who don't have access to books at home. "We've conducted the book drive for the past three years and this has been the most successful year yet," said Frank Stewart, Manager, Golden Field Office. "Today's students will be the scientists and engineers we will need to keep our nation strong, and the first step must be to teach them to enjoy reading."

The Department of Energy recently announced the availability of $700,000 in funding for feasibility plans and studies for the installation of **renewable energy projects at Native American Tribal colleges and universities**. The feasibility studies are for projects to be competed in 2001. Proposals will be accepted only from tribal colleges and universities and must be integrated with educational programs and science curricula. Eligible technologies include photovoltaics, wind, biomass power, hydropower, concentrating solar power, solar thermal systems, geothermal electricity generation, and geothermal resources for direct heating. The closing date for submission of proposals is June 21, 2000. For more information, contact Ruth Adams, 303-275-4788.

Representatives from seven Northeast community colleges recently visited the Department of Energy's **Brookhaven National Laboratory** to learn about a 10-week summer institute for highly motivated community college students interested in a career in biotechnology, environmental science, or computing. The students selected will be mentored by Brookhaven scientists, learn how to apply the scientific method to solve problems, use state-of-the-art instruments in research projects, and learn about career options in science and technology. ❖

HAMMER reaches out to community

It all began with a phone call from Todd Kenning of the Columbia River Exhibition of History, Science and Technology (CREHST) to the Department of Energy's Volpentest HAMMER Training and Education Center (HAMMER) in Richland, Wash. A retired science teacher of 30 years, Kenning was looking for subject-matter experts to enhance a month-long After School Counterfeiting Special at the museum.

He learned that Roger Moerman, a specialist in the detection of counterfeit parts from the Maryland firm ManTech, would be teaching a "Suspect and Counterfeit Parts" course to instructors at the HAMMER facility. ManTech specializes in systems assurance, both physical and informational, where counterfeiting of computer components can be a problem. The company investigates the integrity of software used to control data or operations of critical systems and performs vulnerability assessments of computer systems.

Arrangements were made for a presentation at the CREHST museum. During Moerman's presentation, students learned that counterfeit parts are often weaker than authentic parts, causing machinery to perform improperly—and sometimes fail completely. When that happens, people can experience serious injury or death. By examining and comparing sets of true and counterfeit parts, the students at CREHST experienced firsthand how to distinguish the real from the fake. They also learned how important it is to eliminate the counterfeit parts.

The Department's HAMMER facility is involved in hands-on training programs that protect workers, the environment, and the general public. The facility is managed by Fluor-Hanford. Although the first priority is serving the needs of Hanford Site workers and the DOE complex, HAMMER provides training for others. The facility is fast gaining fame across the nation and around the world for its life-sized worker-designed props and realistic hands-on training simulations. ❖

Savannah River KAMS ready to operate

The pieces are in place for the first element of the new plutonium mission of the Department of Energy's Savannah River Site. In late January 2000, Savannah River Manager Greg Rudy gave the "thumbs-up" for the K Area Materials Storage (KAMS) facility to begin operations. This marked the completion of a project that began nearly two years ago, when it was decided that 105-K—the K Reactor Building—would be an ideal interim storage location for some of the nation's excess plutonium before new disposition facilities come on line.

Considerable modifications were made to 105-K over the last two years, the most visible of which was reducing the stack by 70 feet to forever alter the skyline of K Area. Other major changes involved removing some interior structures and adding others.

"Westinghouse Savannah River Company is proud to have accomplished this important milestone in a manner that exemplifies successful implementation of safe and effective project management, principles, and practices," says Bill Johnson, Vice President and General Manager of the Spent Fuel Storage Division, with operates KAMS.

The cost to modify 105-K for its new mission was $35 million. Phase I of KAMS, which involves the process room and crane wash areas, was completed nearly a week earlier than the target schedule. KAMS Phase II, which will include the crane maintenance and stack areas, is on target for completion within a year.

The KAMS facility at the Savannah River Site is ready to operate as an interim storage location for surplus plutonium.

In January 2000, the Department announced its decision to safely and securely dispose of up to 50 metric tons of surplus plutonium from the United States in a hybrid approach and to construct and operate three new facilities at the Savannah River Site. The hybrid approach allows for the immobilization of approximately 17 metric tons of surplus plutonium and the use of up to 33 metric tons as mixed oxide (MOX) fuel.

The new plutonium disposition facilities will provide pit disassembly, plutonium conversion, immobilization, and MOX fuel fabrication services. The facilities will be located in F Area at the Savannah River Site, with construction scheduled to peak in 2003. Savannah River was selected because it has extensive experience with plutonium processing and the plutonium disposition facilities would complement existing missions and take advantage of existing infrastructure. ❖

Federal building energy use 20 percent less

The Federal Government has reduced energy use in its buildings by 20 percent and saved over $19 billion in building energy costs since 1985. This achievement, which saved taxpayers over $2 billion in energy bills in fiscal year 1999 alone, is one year ahead of the schedule required by the Energy Policy Act of 1992.

"This achievement, one year ahead of schedule, has saved 127.3 trillion Btu's of energy, enough to supply the needs of over one and a quarter million households for an entire year," said Secretary of Energy Bill Richardson. "This translates to substantial savings to the taxpayer and a cleaner environment. Since 1985, greenhouse gas emissions from Federal buildings have been reduced by almost 2.4 million metric tons."

According to fiscal year 1999 data from the 30 largest agencies, the Federal Government has reduced its energy use per square foot by just over 20 percent. The data shows that 110,716 British Thermal Units (Btu) were consumed for each square foot of floor space compared with 139,271 Btu/square foot in 1985.

The Federal Government is the country's single largest energy user, accounting for almost two percent of total U.S. consumption and an annual energy bill of roughly $8 billion. Energy consumed in the Federal Government's 500,000 buildings accounts for almost one half of the government's total energy cost.

In addition to the Department of Energy, Federal agencies achieving energy reductions of 20 percent or more include the Departments of Agriculture, Commerce, Defense, Justice and Transportation; the National Aeronautics and Space Administration; the Tennessee Valley Authority; and the U.S. Postal Service. Approaches used by Federal energy managers to achieve the goal, include:

- improving operations and maintenance procedures in heating, ventilation, and air-conditioning systems and implementing no-cost, low-cost energy efficiency measures;
- using private-sector funding and partnerships, such as the Department of Energy's Super Energy Savings Performance Contracts program, to retrofit and increase the energy efficiency of the buildings; and
- procuring energy-efficient ENERGY STAR® products and equipment. ❖

Researchers decode three human chromosomes

Researchers at the Department of Energy's Joint Genome Institute in Walnut Creek, Calif., have decoded in draft form the genetic information on human chromosomes 5, 16, and 19. The chromosomes contain an estimated 10,000 to 15,000 genes whose defects may lead to genetically linked diseases.

The human genome is the full complement of genetic material in a human cell. It contains instructions for making all the protein molecules for all the different kinds of cells of the human body. In decoding DNA, researchers determine the "sequence" or exact order of the individual chemical building blocks, or bases, that make up the DNA.

The three chromosomes sequenced by Department researchers contain more than 300 million base pairs, or an estimated 11 percent of the total human genome. Chromosome 5 contains an estimated 194 million bases—about six percent of the human genome. Disease-linked genes on this chromosome include those for colorectal cancer, basal cell carcinoma, acute myelogenous leukemia, salt-resistant hypertension, and a type of dwarfism.

Chromosome 16, with about 98 million bases, makes up about three percent of the human genome. Studies have implicated genes on this chromosome in the development of breast and prostate cancer, Crohn's disease, and adult polycystic kidney disease. Chromosome 19 contains 60 million bases, or two percent of the human genome. Genes involved in DNA damage repair and associated with atherosclerosis and diabetes mellitus are located on this chromosome.

The Joint Genome Institute (JGI) is one of the largest publicly funded human genome sequencing centers in the world. A consortium of the Department's Lawrence Berkeley, Lawrence Livermore, and Los Alamos National Laboratories operates the institute. Computer analysis of sequences to identify the locations of genes is being conducted by the Department's Oak Ridge National Laboratory.

The Department of Energy began the Human Genome Project in 1986. The project's ultimate goal is to discover the 80,000 to 100,000 human genes on the 23 pairs of chromosomes and enable biologists to study them in detail. Now a publicly funded international research project, responsibility for sequencing the chromosomes is divided among the Department, the National Institutes of Health (NIH), and the Wellcome Trust in England. The project expects to complete the draft for the entire human genome in June 2000, with a final sequence available on or before 2003.

Additional information on the three chromosomes and the JGI is available at **http://www.jgi.doe.gov**. Additional information on the Human Genome Project is available at **http://www.sc.doe.gov/geno_res/index.htm**. ❖

NEW Publications

Office of Inspector General reports: ***The Department's Management and Operating Contractor Make-or-Buy Program*** (DOE/IG-0460); ***Groundwater Monitoring Activities at Department of Energy Facilities*** (DOE/IG-0461); ***National Low-Level Waste Management Program*** (DOE/IG-0462); ***Commercial Off-the-Shelf Software Acquisition Framework*** (DOE/IG-0463); ***Follow-on Review of the Status of the U.S. Department of Energy's Counterintelligence Implementation Plan*** (DOE/IG-0464); ***Inspection of the Department of Energy's Export License Process for Foreign National Visits and Assignments*** (DOE/IG-0465); ***Implementation of Integrated Business Information Systems Within the Department of Energy*** (DOE/IG-0466). Available from the U.S. Department of Energy, Office of Inspector General Reports Request Line, 202-586-2744; or at **http://www.ig.doe.gov/**.

Opportunities for Energy Savings in the Residential and Commercial Sectors with High Efficiency Electric Motors, prepared for the Department of Energy's Office of Energy Efficiency and Renewable Energy, reports that electric motors in homes and commercial buildings consume about 8.8 quadrillion Btu (British thermal units) of energy annually, more than one-third of all the electricity used in the nation's buildings. The report also notes that more than two quadrillion Btu can be saved by using more efficient motors and variable speed drives. The full report is available at **http://www.eren.doe.gov/buildings/documents/**.

Electric Power Monthly, March 2000 (DOE/EIA-0226-2000/03), from the Department of Energy's Energy Information Administration, reports that in 1999, U.S. commercial nuclear powerplants generated more electricity—about 728 billion kilowatt hours—than in any previous year in the industry's history. Available from the U.S. Government Printing Office, 202-512-1800; the National Energy Information Center, EI-30; Room 1E-238 Forrestal Building, USDOE, Washington, DC 20585; 202-586-8800; and at **http://www.eia.doe.gov**. ❖

West Valley Project is a 'star'

On May 5, Secretary of Energy Bill Richardson made his second visit to the Department of Energy's West Valley Demonstration Project in New York. During the visit, Secretary Richardson recognized West Valley as one of the Department's safest sites and presented the Voluntary Protection Program "STAR" award and flag to West Valley Nuclear Services Co. and project officials.

"I said when I came to the Department of Energy in 1998 that 100 percent is the only safety goal to strive for," Secretary Richardson said. "Because the work here is extremely demanding and at times dangerous, safety must be a top priority."

The Voluntary Protection Program (VPP), coordinated by the Department's Office of Environment, Safety and Health, promotes safety and health excellence through cooperative efforts among labor, management, and government at DOE contractor sites. The program consists of three categories—STAR, MERIT, and DEMONSTRATION.

Contractors that meet the requirements for outstanding safety and health performance receive STAR recognition, the highest achievement level. Contractors with highly effective programs, that commit to attaining STAR status within five years, receive MERIT recognition. A site can maintain MERIT recognition for a maximum of five years. The DEMONSTRATION category allows VPP participation by contractors with excellent safety and health programs needing further study. Once approved, STAR sites are reevaluated every three years, while MERIT and DEMONSTRATION sites are evaluated annually. Additional information on the program is available at **http://tis.eh.doe.gov/vpp**.

At the STAR award ceremony are (l-r) Secretary Richardson; Bob Campbell, President, West Valley Nuclear Services (WVNS); John Beltz, President, Lodge 2401, WVNS International Association of Machinists and Aerospace Workers; Barbara Mazurowski, DOE Director, West Valley Demonstration Project; and Paul Piciulo, West Valley Manager, New York State Energy Research and Development Authority.

West Valley is one of only six Department sites to achieve STAR status. Other Department sites are Honeywell Federal Manufacturing and Technologies, Kansas City Plant; the Waste Isolation Pilot Plant, Carlsbad, N. Mex.; the Weldon Spring Site Remedial Action Project, St. Charles, Mo.; Westinghouse Savannah River Company, Aiken, S.C.; and Wackenhut Services Inc., Savannah River.

The West Valley Demonstration Project is a Department of Energy environmental cleanup and waste management project conducted in cooperation with the New York State Energy Research and Development Authority. West Valley Nuclear Services, a Westinghouse Government Services Group company, manages and operates the project for the Department. ❖

Digital filing debuts for oil drilling permits

On May 11, a Texas oil field operator logged on to the Internet from a computer terminal in Dallas and filed the world's first electronic application for an oil drilling permit. This marks a new era in paperless permitting for the U.S. oil and gas industry that was set into motion in 1999 with a Department of Energy grant to the Texas Railroad Commission for one-third of the $2.1 million cost to develop and test an Internet-based permitting system.

The historic first transmission took place during a workshop, "Putting the Internet to Work," sponsored by the Department of Energy-supported Petroleum Technology Transfer Council and attended by oil and gas industry executives. The operator, an employee of Burlington Resources, received an electronic acknowledgment within minutes indicating that the permit had been registered with the Texas Railroad Commission, the state's oil and gas regulatory agency. Paper forms previously required several days or weeks to process.

"Today, Texas and the nation's oil industry took an important step into the digital future, replacing stacks of paper forms with a few computer keystrokes and mouse clicks," said Secretary Richardson. "This initiative can save the industry and its regulators millions of dollars and countless hours of labor."

The pilot program, called the Electronic Compliance and Approval Process (ECAP), focuses on electronic filing, review, and approval of drilling permits, which comprise about 10 percent of the more than 150,000 oil-related compliance permits filed in Texas each year. Plans are to expand ECAP to include more complex drilling permits, additional attachments and reporting capabilities. By September 2001, the Texas Railroad Commission plans to adapt the paperless process to the entire regulatory life cycle of oil and gas wells in Texas.

The ECAP system eliminates paper handling and duplicate data entry and shortens the approval process by two to four days. If Texas operators use the online process for only 25 percent of the state's oil and gas permits, the Commission estimates annual savings of more than $17 million. ❖

Department celebrates Earth Day 2000

On April 22, approximately 500 million people and 4,500 organizations in 181 countries around the world celebrated the 30th anniversary of Earth Day. "Clean Energy Now" was the global theme for Earth Day 2000 and events in Washington, D.C., New York City, and Boston, Mass. were all powered exclusively with clean energy.

Secretary of Energy Bill Richardson addressed thousands of participants at the Earth Day Rally on the National Mall in Washington, D.C. "The theme of Earth Day 2000 is 'Clean Energy Now'—and now means now," said Secretary Richardson. "No longer can we delay using renewable energy such as wind, solar and biomass. No longer can we delay a more efficient use of energy across the board. It we ignore the truth, if we shirk this responsibility, we will leave a legacy of air unfit to breathe, water unfit to drink, and a planet sweltering under a shroud of greenhouse gas. This day—Earth Day—is a reminder to America, and the world, that its future is at stake."

An all-star lineup of speakers and performers took part in the Washington, D.C. celebration. Five major tented exhibits and the large multimedia stage were powered with a combination of wind, solar, natural gas, biofuels, propane, reciprocating engines, and advanced microturbines. Funding to help develop many of the technologies was provided by the Department of Energy, which consulted with the Earth Day Network on how best to supply the power needed by a major event.

To coincide with Earth Day, Secretary Richardson directed the Department of Energy to buy more "green power." The Department is the first Federal agency to make such a Departmentwide commitment to purchase a portion of its electricity from renewable energy sources. Secretary Richardson also announced that the Department is awarding $630,000 in grants to 17 state and local partnerships in 13 states to help install a million solar roofs on U.S. buildings by 2010. Information on the grants and Million Solar Roofs Initiative is available at **http://www.eren.doe.gov/millionroofs/**.

On Earth Day and throughout the month of April, many Department sites participated in and sponsored environmental activities. Some of the activities:

- On April 21, Office of Fossil Energy-manned exhibits outside the DOE Headquarters Forrestal Building provided the public with information on new oil, gas, and coal technologies; the environmental benefits of advanced oil and gas exploration and production; the Vision 21 program to design the power plant of the future; fuel cells; carbon sequestration; and successful clean coal technology projects.
- On April 29, the Idaho National Engineering and Environmental Laboratory (INEEL) cosponsored and participated in the Idaho Falls community Earth Day celebration, which featured exhibits and a "recycled art" contest.
- The National Renewable Energy Laboratory helped the Colorado Sustainability Project and Colorado Renewable Energy Society organize the Earth Fair celebration in Denver April 14-16. The fair featured five pavilions of exhibits and activities on renewable energy, energy efficiency, transportation, buildings, and the environment.
- The Lawrence Berkeley National Laboratory sponsored and participated in Earth Month activities, including the Berkeley Lab Eco Fair, beach cleanup, the City of Berkeley Earth Day celebration, and tours of recycling and water treatment centers.
- The Bonneville Power Administration promoted employee awareness of Earth Day and local activities and joined forces with Friends of Trees to plant more than 100 deciduous and evergreen trees.
- The Lawrence Livermore National Laboratory (LLNL) held Earth Expo 2000, featuring a variety of environmental exhibits by LLNL programs, other DOE sites, and outside organizations. ❖

Students join Under Secretary Ernest Moniz and actress Donna Mills at the Department of Energy's clean energy exhibit on the National Mall.

Secretary Richardson, featured on the Jumbotron, addressed the crowd from the stage at the Earth Day 2000 Rally on the National Mall in Washington, D.C.

duPont Manual wins National Science Bowl®

On May 8, following an intense two-day competition of round robin matches and double elimination rounds, the student team from duPont Manual High School, Louisville, Ky., claimed top honors in the Department of Energy's 10th Anniversary National Science Bowl®. "The students from duPont Manual have put their best brain power forward, challenging 59 other teams from across the country to win the Energy Department's National Science Bowl competition," said Secretary of Energy Bill Richardson as he presented the championship trophy.

The team's regional sponsor was Murray State University. As one of the prizes for winning the competition, the team will participate in a one-week science research trip, "Trekking Across Washington," sponsored by the Department's Pacific Northwest National Laboratory.

The remaining top five winners, regional sponsors, and their prizes of one-week research trips at Department of Energy sites are:

Second: Montgomery Blair High School, Silver Spring, Md.; DOE Headquarters; "Wet, Wild, and Wonderful," sponsored by the Savannah River Site;

Third: A&M Consolidated High School, College Station, Texas; Texas A&M University; "Warping Through Science," sponsored by Bates Linear Accelerator Laboratory and Massachusetts Institute of Technology;

Fourth: North Hollywood High School, California; Los Angeles Department of Water and Power; "3 Rivers and Beyond Science Tour," sponsored by the National Energy Technology Laboratory; and

Fifth: Gateway Senior High School, Monroeville, Pa.; National Energy Technology Laboratory, Pittsburgh; "Step Into the High-Tech Old West," sponsored by Pantex Plant.

Each student member of the top five teams received a TI-89 calculator courtesy of Texas Instruments. The coaches of the top five teams received IBM WorkPads courtesy of IBM. The first through third place teams also received Calculator Based Laboratories II from Texas Instruments for their schools.

Secretary Richardson presents the winning trophy to duPont Manual High School. L-r are James Decker, Acting Director, DOE Office of Science; Glenn (Skip) Zwanzig, team coach; Yan Xuan; Matthew Reece; Secretary Richardson; Gabe Wood; Marty Mudd; and Mariah Cummins.

Punahou School, Honolulu, Hawaii, sponsored by the DOE Pacific Liaison Office, garnered the Civility (Sportsmanship) Award. The team will travel to Colorado to participate in a one-week High School Excavation Program in Crow Canyon. Each team member received an IBM WorkPad.

The 18 teams that reached the double elimination portion of the tournament each received a plaque and $1,000 for their school's physics laboratory. In addition to the top five winners, the following schools advanced to the double elimination rounds:

Albuquerque Academy – sponsored by New Mexico Central; Beavercreek High School – Babcock & Wilcox of Ohio; Booker T. Washington High School – National Petroleum Technology Office; Chapel Hill High School – North Carolina Central University/NORTEL; Louisiana School for Math, Science and the Arts – Strategic Petroleum Reserve; Loveland High School – Western Area Power Administration Rocky Mountain Region; Mississippi School for Math and Science – Oak Ridge National Laboratory; Newton North High School – Brown University; Oviedo High School – Lake Brantley-Central Florida; Paul M. Dorman High School – Savannah River Site; Reno High School – Nevada Operations Office; Sycamore High School – Fernald Environmental Management Project; and Troy High School – NASA Jet Propulsion Laboratory.

The National Science Bowl is the premier high school science and mathematics academic competition in the United States. The Department of Energy developed the competition in 1991 to encourage high school students across the nation to excel in mathematics and science and to pursue careers in those fields. Cosponsors of this year's tournament were Bechtel Foundation, Texas Instruments, IBM, and Delta Airlines.

In 2000, more than 11,000 students from 1,900 high schools competed in regional competitions in 39 states, the District of Columbia, and the U.S. Virgin Islands. The regional tournaments were sponsored by Department facilities and laboratories, other Federal agencies, educational institutions, and organizations. More than 5,000 department employees, contractors, and community members volunteered their time to make the program a success. ❖

Wildfire strikes Los Alamos, impacts employees

On May 4, a prescribed burn to clear brush at Bandelier National Monument in New Mexico quickly escalated, with the help of sporadic wind changes, into the largest-ever wildfire in the state. On May 10, the Cerro Grande Prescribed Fire, carried by very high winds, entered Los Alamos Canyon, heading toward the towns of Los Alamos and White Rock. More than 18,000 residents were evacuated.

The fire also spread in the direction of the Department of Energy's Los Alamos National Laboratory (LANL). The Department closed the laboratory to protect employees, but maintained vigilance with security forces protecting the facilities, critical material, and sensitive equipment. The fire burned more than 9,000 acres of LANL property. Air monitoring by LANL indicated no releases of radiation occurred. On May 22, many of the laboratory's facilities were cleared for occupancy. Laboratory managers called employees back to the job beginning May 23.

On May 11, Secretary of Energy Bill Richardson visited Los Alamos and personally saw the damage and devastation wrought by the fire. The fire burned over 47,000 acres, destroyed about 260 homes in Los Alamos, damaged many other structures, caused an estimated $1 billion in damage, and displaced thousands of Department of Energy and contractor employees and their families. On May 13, President Clinton declared a major disaster in the State of New Mexico, making Federal funding available to affected individuals in a 12 county area.

The Department's Los Alamos Area Office suffered smoke damage from the fire and was closed until safety engineers determined the building safe to occupy. The Department temporarily relocated the Area Office to the LANL administration building. On May 17, the 65 employees of the Area Office gathered in Santa Fe for an all-hands staff meeting to discuss employee needs and operation of the office.

"The main message I want to send to you is that the Department of Energy is here to support you and your families through this disaster in any way that we can," Secretary Richardson told the employees by phone. "Yesterday (May 16), President Clinton announced that all Federal employees affected by the fire will not lose pay or be charged leave for any time needed to recoup from personal emergencies or to assist in cleanup efforts. And, we will carry out this directive at the Department very, very strongly."

Secretary Richardson praised the University of California, the prime contractor at LANL, for unveiling a comprehensive emergency response plan which includes a $150,000 relief-fund donation, low interest loans, an expanded leave with pay policy, and additional counseling services. Throughout the ordeal, LANL employees were kept informed on the laboratory's status, disaster relief, available assistance, and fire updates on the laboratory's home page.

"Everyone associated with the Department of Energy has been saddened by the fire's destruction and recognizes that the road to recovery will be a long one," Secretary Richardson said. "The community has my assurances that the Department will do everything within its powers to help our employees, our contractors, and the impacted communities." ❖

Fund established to help Los Alamos employees

The devastating wildfire in northern New Mexico was 95 percent contained on May 22 and fully contained a few days later. While evacuated residents have returned to their neighborhoods, those fortunate enough to still have homes returned to find smoke and water damage and limited basic utilities. It will be a long-term recovery process for the communities as they reopen schools, hospitals, and government services.

The Northern New Mexico Fire Recovery Fund has been created by the Department of Energy to assist Federal and contractor employees of its Los Alamos Area Office and Los Alamos National Laboratory. Secretary of Energy Bill Richardson established the disaster relief fund following his visit to Los Alamos to personally assess the devastation.

"The Department of Energy has an obligation to help our Federal and contractor employees as well as the communities suffering because of the fire," Secretary Richardson said. "While there are relief agencies providing on-the-spot assistance, we know this will be a long and difficult recovery process for our employees and surrounding communities. This fund is intended to assist our employees and communities as they will surely face many unforeseen and uncovered expenses in the coming months."

The fund is authorized to accept gifts from public and private sources. All donations are tax deductible. The Department's Chief Financial Officer will administer the fund. An Executive Board will be designated to accept and review applications and distribute the fund. One hundred percent of the funds collected will go directly to our Federal and contractor employees and their communities.

Checks should be made payable to the Department of Energy and indicate they are for the Fire Recovery Fund. Donations can be sent to:

U.S. Department of Energy
Attn: Northern New Mexico Fire Recovery Fund
Office of Chief Financial Officer, CR-52
P.O. Box 500
Germantown, MD 20874-0500 ❖

Savannah River 'Gator' feeds on hydrogen

Most gators at the Department of Energy's Savannah River Site crawl out of the site's waters. But now, Savannah River has a new gator that can haul cargo around a warehouse and runs on hydrogen energy.

Gator is the Savannah River Technology Center's (SRTC) latest hydrogen vehicle project, a zero-emission Industrial Fuel Cell Vehicle. SRTC is working with several partners to design, develop, demonstrate, and ultimately commercialize the vehicle.

The design team started with a Deere and Company Gator utility vehicle, then added a fuel cell power system from Energy Partners Inc. Teledyne Brown Engineering is developing a refueling system. An SRTC-developed hydride bed stores the vehicle's hydrogen fuel. Testing of Gator 1 is ongoing. An improved Gator 2 is scheduled to be completed this spring. ❖

U.S., China firms agree on geothermal heat pump sales

Representatives of the Trane Corporation of Texas and the Fuland Property Development Company of Beijing, China, recently signed an agreement at Department of Energy Headquarters, Washington, D.C., for a demonstration project using geothermal heat pumps in a 33-story apartment building currently under construction in Beijing. The agreement represents a firm commitment from Chinese partners to purchase nearly $1 million worth of U.S.-made equipment from Trane Corporation.

A feasibility study funded by the Department encouraged use of the technology as a cost-effective, energy efficient, and environmentally friendly way to heat and cool buildings in China.

Signing the agreement are Raymond Fung, Beijing Office, Trane Corporation (left) and Xu Zheng, Chairman, Fuland Property Development Company. Immediately behind the signers, l-r, are Lee Gebert, DOE Office of Power Technologies; Li Xiuguo, Chinese Academy of Sciences; Dan Reicher, DOE Assistant Secretary for Energy Efficiency and Renewable Energy; and Liu Zhaodong, Science and Technology Counselor, Embassy of China. ❖

Sandia 'smart scalpel' possible tool against cancer

Scientists at the Department of Energy's Sandia National Laboratories have developed a prototype "smart scalpel" mechanism that can detect cancerous cells and help surgeons more accurately cut away malignant growths while minimizing the amount of healthy tissue removed. In effect, the dime-sized device, (at right), called a biological microcavity laser or biocavity laser for short, would tell a surgeon when to stop cutting. The patented device has distinguished in the laboratory between cultured cells consisting of normal human brain cells, called astrocytes, and their malignant form, called glioblastomas.

The biocavity laser works by incorporating blood cells into the lasing process. A vertical microlaser beam enters individual cells as they are pushed by a micropump through microchannels in the device. The additional density of cancerous cells changes the speed of the laser light passing through them. Data is transmitted by optical fiber to a laptop computer and translated into a graph to show when blood pumped from the incision has been cleared of cancerous cells. ❖

ORNL, Southwire achieve technological milestone

The Department of Energy's Oak Ridge National Laboratory (ORNL) recently helped Southwire Company of Carrollton, Ga., set technological history when the cable manufacturing company energized an electrical power cable using superconductivity. Southwire is the only United States company to have a superconducting cable that has been tested in a real-world industrial setting.

In the photo, Secretary of Energy Bill Richardson, right, and Georgia Governor Roy Barnes throw the switches to convert Southwire's Carrollton plant to a high-temperature superconductor (HTS) power system. Looking on is Roy Richards, Jr., Chief Executive Officer, Southwire. The HTS power system was built and tested with the assistance of ORNL's Superconductivity for Electric Systems Program. The Department's Argonne National Laboratory also was involved in the project.

Superconductors can transmit electricity through cables with virtually no energy losses due to resistance. Superconducting wires can carry up to 100 times more electric current than conventional copper or aluminum wires of the same cross-sectional area. ❖

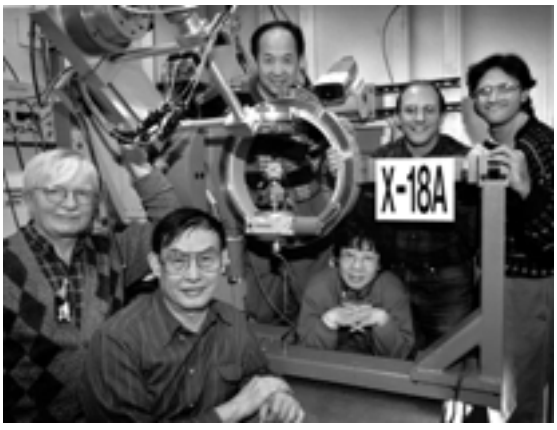
Wyoming students study the environment at NPR-3

Volunteer "teachers" at the Department of Energy's Naval Petroleum Reserve No. 3 (NPR-3) in Wyoming recently worked with a group of environmental science students from Midwest High School. The objective was to give the students a healthy respect for the environment and an understanding of water quality monitoring and testing in an operating oil field.

The students received a tour of the Bio-treatment Facility and an explanation of how it is used to clean NPR-3's produced water before release into surrounding water sources. They collected water samples from around the facility and tested the samples in NPR-3's laboratory for temperature, pH, conductivity, and oil in grease.

This visit was the first of many activities planned by the site for Wyoming students. NPR-3 is building the Rocky Mountain Oilfield Testing Center Science Center in one of the site's unused steam generator buildings. The center will become the students' classroom and science laboratory. ❖

BNL researches new materials for better batteries



The Department of Energy's Brookhaven National Laboratory (BNL), Upton, N.Y., and Gould Electronics, Inc., Eastlake, Ohio, are working together under a Cooperative Research and Development Agreement (CRADA) to create more efficient, more environmentally friendly lithium-ion batteries. Lightweight and rechargeable lithium-ion batteries are used today in laptop computers and cellular phones and could be the future battery of choice for electric cars.

BNL researchers are developing a new class of electrolytes—substances that conduct electricity in a battery. New boron-based compounds have shown the most promise. Inexpensive and nontoxic salts, such as lithium fluoride and lithium chloride, can be used to replace the expensive and toxic salts in electrolytes. The new electrolytes are being studied at Brookhaven's National Synchroton Light Source (NSLS) and tested in lithium-ion batteries developed by Gould Electronics.

At the NSLS beam line (l-r) are researchers James McBreen, Hung Sui Lee, Xiao-Qing Yang, and Xuehui Sun of BNL; John Schwanof, Purdue University; and Mahalingam Balasubramanian, BNL. ❖

Staff completes Executive Potential Program

On March 17, 2000, 28 Department of Energy employees from eight Headquarters and 10 field offices marked their completion of the 1999/2000 Executive Potential Program with a formal graduation ceremony in Hunt Valley, Md. The Department employees were members of a class of approximately 150 graduates from agencies across the Federal Government.

The Executive Potential Program is administered by the U.S. Department of Agriculture Graduate School and provides leadership training and developmental experiences to high potential GS-13/14/15 employees. During the year-long program, participants are required to complete four weeks of competency-based training, a benchmarking exercise, four executive interviews, two 60-day developmental assignments, a shadowing assignment, and a special group project. Participants complete the program requirements while maintaining responsibility for the duties of their current positions.

In the photo, seated (l-r) are graduates Tanya Luckett, Management and Administration (MA); Barry Gaffney, Environmental Management; Richard Dennis, National Energy Technology Laboratory; James Rowe, MA; Ray Buck, Security and Emergency Operations; Dollie Clayton, MA; and Adrian Gardner, Independent Oversight and Performance Assurance (OA).

Standing, first row (l-r): John Trainor, Defense Programs (DP); Tracy Bishop, DP; Julie Turner, Richland Operations Office (RL); Judith Holm, Albuquerque Operations Office; Monica Michewicz, Civilian Radioactive Waste Management; Nina Akgunduz, Ohio Field Office (OH); Paul Coombs, MA; Anita Johnson, MA; Larry Lanes, Defense Nuclear Nonproliferation, NNSA; Kathy Hall, OH; Phyllis Byrd, MA; Tiajuana Cochnauer, Idaho Operations Office; and Sheldra Baker-Robinson, Strategic Petroleum Reserve Project Office.

Standing, second row (l-r): Barry Dyson, Energy Information Administration (EIA); Bill Szymanski, EIA; Roger Merrick, Rocky Flats Field Office; Tom Treger, Savannah River Operations Office; Pamela Pontillo, DP; Jon White, Yucca Mountain Site Characterization Office; and Pete Siebach, Chicago Operations Office. Not pictured is Gregory Jones, RL.

The Executive Potential Program and other development programs—Executive Leadership Program, New Leader Program, Aspiring Leader Program—are instrumental in preparing high potential employees to assume senior-level positions. The Office of Training and Human Resource Development (MA-31) manages the Executive Potential Program for the Department. For additional information, contact Mary Jo Edwards, MA-31, 202-426-1518. ❖

Study assesses Native American energy needs

The Department of Energy has released the first comprehensive study of energy needs and resources on Native American lands. The "Indian Energy Study" sets a foundation for long-range economic growth by helping tribes evaluate their energy needs so that they can improve access to services. The report was prepared by the Department's Energy Information Administration (EIA).

"This study catalogs, for the first time, the actual energy needs of tribes, which historically have suffered from lack of access to electricity and other basic infrastructure needs," said Secretary of Energy Bill Richardson. "I'm committed to helping the tribes meet their own energy needs and to encouraging sustainable development. Every tribe must have access to sufficient, affordable and reliable electricity."

The study found that many tribes are still isolated and that opportunities for serious economic development will be limited until the tribes have equal access to services most Americans take for granted, like electricity. Among the findings are:

- 14.2 percent of all Indian homes on reservations have no access to electricity, compared to 1.4 percent for all U.S. households.
- A typical Indian household spends four percent of its income on electricity, twice that of the typical U.S. household. The poorest Indian households spend nearly 20 percent.
- Some Indian lands appear to have great potential for renewable energy development, particularly wind, solar, and biomass energies.

Energy Consumption and Renewable Energy Development Potential on Indian Lands is available on the Internet at **http://www.eia.doe.gov/cneaf/solar.renewables/ilands/ilands.pdf**. Printed copies are available from the EIA National Energy Information Center, 202-586-8800. ❖

Oil reserve system completes modernization

The Department of Energy has completed a seven-year, $328 million modernization of the Strategic Petroleum Reserve (SPR), giving the nation's emergency crude oil stockpile another 25 years of useful life. The project was completed ahead of schedule and nearly $42 million below its original cost estimate.

"Today we can say that the United States not only has the largest reserve of emergency crude oil but also the most modern," said Secretary of Energy Bill Richardson. "The Strategic Petroleum Reserve is now ready to continue as this country's first line of defense against oil disruptions for at least the next quarter century."

The Reserve, established in 1975 following the first major oil crisis, currently holds nearly 570 million barrels of crude oil and has the storage capacity for another 130 million barrels. The complex of deep oil storage caverns along the Gulf of Mexico was designed to last 20 years. In 1993, the Department began a systematic effort to upgrade the Reserve's four oil storage sites in Louisiana and Texas.

As a result of the refurbishment, operating costs of the SPR will be reduced by $12 million to $15 million annually over the next 25 years, primarily because less equipment and fewer employees will be needed for maintenance and operation. For example, engineers were able to reduce the number of pumps needed to move crude oil by almost 40 percent, eliminating 60 large high-horsepower pumping units; and more than 900 of the Reserve's 1,800 valves also were eliminated. Many other components have been standardized and automated, making maintenance and inventory control more efficient and less expensive.

The modernization involved 26 major subcontractors, including six construction firms and 20 equipment suppliers. The Department's SPR Project Office in New Orleans and DynMcDermott Petroleum Operations, the SPR management and operating contractor, oversaw the effort. ❖

Robot wrecker runs by video remote control

Sometimes the best way to get work done is to take the workers away from the scene. That was the idea behind a project by the Department of Energy's Idaho National Engineering and Environmental Laboratory (INEEL) and Oak Ridge National Laboratory (ORNL) to design a state-of-the-art, real-time video feed system for a robot wrecking machine—the BROKK BM 250.

The demolition robot is about the size of a compact car and sits on four wheels. Extending from a pivoting base is a hydraulic boom that can stretch up to 15 feet. Operators generally manipulate the BROKK, which is a commercially available product, using a tether or by radio remote control. The operator normally stands alongside it or away at a distance of up to 400 feet.

Both laboratories face the same demolition problems—tearing down buildings that are contaminated with radiation. Operating the robot with the video technology provides safer work environments at remote distances.

ORNL designed the operator's chair and base, called the compact remote console. It serves as the "data link" for the electronic hardware that controls four video cameras, camera controllers, four viewing monitors and BROKK's remote controller. INEEL developed the fiber optics, the stationary zoom cameras, two similar cameras mounted on the robot, and the software to run the video feed. The console's design allows for quick dismantling, transfer, and setup. It can fit through any standard office doorway and is designed to be ergonomically compatible for any operator.

Bret Hillman, INEEL heavy equipment operator, tests the fiber optics real-time video system which acts as his eyes for the BROKK demolition robot.

Matthew Anderson, INEEL robotics technical lead for the BROKK real-time video project, says this project is an example of how robotics is helping the Department of Energy reduce hazards to people, reduce secondary waste, improve productivity, and reduce technical risk by introducing new technologies. The first official INEEL use of the video system on BROKK will be at the Advanced Reactivity Measurement Facility at the Test Reactor Facility.

The technology was developed under the Robotics Crosscutting Program of the Department's Office of Environmental Management. Information on this and other innovative technologies used at INEEL is available at **http://tech.inel.gov**. ❖

Energy cooperation advanced in South Asia

From March 4-11, 2000, Deputy Secretary of Energy T. J. Glauthier visited Nepal and the Philippines, the highest ranking Department of Energy official ever to visit the countries. While in Kathmandu, Deputy Secretary Glauthier met with Nepal Minister of Foreign Affairs Ram Sharan Manat and shared the podium with Prime Minister of Nepal Krishna Prasad Bhattarai when he delivered a keynote address at the "Energy South Asia" conference.

The "Energy South Asia" conference was organized by the U.S. Trade and Development Agency (TDA), and cosponsored by the Departments of Energy, State, and Commerce and the U.S. Agency for International Development. About 200 senior government officials from all South Asian nations and senior executives from American companies and South Asian firms in the region attended the conference. The purpose of the conference was to facilitate contracts for American firms on energy infrastructure projects in South Asia.

During the conference, Deputy Secretary Glauthier also met with the heads of delegations from Bangladesh, Bhutan, India, Maldives, Pakistan, and Sri Lanka and with the Secretary General of the South Asia Association for Regional Cooperation. The meetings conveyed to the South Asian governments the benefits of greater regional energy integration of a restructured energy sector that separates the policy and regulatory function of government, and the opportunities offered by U.S. firms in deploying clean energy technologies. The meetings with the Indian and Bangladeshi delegations in particular advanced preparations for President Clinton's March trip to the region.

At the Energy South Asia conference are l-r Prime Minister of Nepal Krishna Prasad Bhattarai; Karen Turner, Deputy Assistant Administrator for Asia and the Near East, U.S. Agency for International Development; Jay Hakes, Administrator, Energy Information Administration; Herb Davis, Executive Director, U.S. Bangladesh Business Council; Joe Grandmaison, Director, U.S. Trade and Development Agency; and Deputy Secretary of Energy T. J. Glauthier.

In Manila, Deputy Secretary Glauthier signed a Clean Energy Statement with Philippine Secretary of Energy Mario Tiaoqui. He also signed a $353,800 TDA grant for an electric power transmission study with Federico Puno, President of the National Power Corporation. Deputy Secretary Glauthier also met with U.S. firms and championed the firms in all his meetings in both Manila and Kathmandu. ❖

Management changes strengthen NIF oversight

Secretary of Energy Bill Richardson has instituted several management changes that will strengthen oversight of the National Ignition Facility (NIF) at the Department of Energy (DOE) and its Lawrence Livermore National Laboratory (LLNL). The changes address many of the shortcomings identified during the Department's internal review of the project.

The review concluded that inadequate management at LLNL and DOE and resulting lack of oversight led to major cost and schedule problems and to delays in notifying senior Department officials of those problems. "I remain deeply disappointed at the manner in which these problems were handled," said Secretary Richardson. "But I am also convinced that the underlying science of the NIF remains sound."

The changes at DOE Headquarters, DOE Oakland Operations Office, LLNL, and the University of California, which manages the laboratory for the Department, include:

- establishing a NIF Project Office at DOE Headquarters;
- increasing the Oakland Operations Office staff assigned to NIF to six full-time employees and co-locating them with the NIF project;
- establishing a new Associate Director for NIF Programs at LLNL, dedicated solely to the project and its success and reporting straight to the laboratory director;
- creating a new standing panel of the University of California President's Council to oversee LLNL construction projects and increase interaction with the NIF Project Office;
- designating NIF as a pilot project for the Congressionally mandated Project Management and Oversight function, providing an on-site contractor with project management expertise to the Department; and
- placing the NIF Project on the Department's Chief Operating Officer Watch List, where key project decisions must be approved by the Deputy Secretary of Energy before funding continues.

Under a rebaseline plan, the first NIF laser beams are scheduled to come on-line in 2004, with all laser beams operational in 2008. A NIF fiscal year 2001 budget and interim rebaselining report are due to Congress by June 1. ❖

Secretary rededicates Department to diversity

On April 5, in a memorandum to all Department of Energy employees, Secretary of Energy Bill Richardson rededicated the Department to the principles of diversity—equity, opportunity, accommodation, nondiscrimination, and inclusion. On the same day, Department employees and contractors nationwide participated in a diversity training "stand-down" for a portion of their workday.

"We must build a culture of respect and inclusion, one which welcomes and values the contribution of each employee," Secretary Richardson said in his memorandum. "...we must embrace diversity, for diversity is a catalyst for new ideas, new concepts, and new strategies.... I am committed to ensuring that the Department is a model workplace, where everyone has an equal opportunity to serve, and each person is treated with dignity and respect in all aspects of employment."

The diversity stand-down was one of eight immediate actions directed by Secretary Richardson after receiving a report and recommendations from the Task Force Against Racial Profiling in January 2000. The task force was established by Secretary Richardson to investigate employee concerns about possible racial or ethnic bias or discrimination following allegations of espionage at the Department's Los Alamos National Laboratory.

The diversity training was conducted in two parts. The first part was a 75-minute session led by Secretary Richardson and Deputy Secretary of Energy T. J. Glauthier that was available via satellite downlink to all DOE sites for every employee to watch, either live or on videotape. The session included remarks by Jeremy Wu, the Department's National Ombudsman, and questions and answers from employees across the DOE complex following the Secretary's presentation.

"I want to stress to all our employees that when they feel there's a problem—something is bothering them, or something is not right—they have a right to speak up, to raise concerns, and to expect that those concerns will be heard, considered, and fairly addressed, without retaliation. That's just good management," Secretary Richardson told employees. "If people at any DOE site feel that their concerns are not being addressed—that they're not being given the respect they deserve—then I want to know about it."

In the second part of the training, each Department facility conducted or will conduct local training programs. At DOE Headquarters, the local training continued immediately after the nationwide program. Nationally renowned diversity speaker Lewis Brown Griggs, Griggs Incorporated, discussed the role of diversity in the workplace. At the Department's National Energy Technology Laboratory, a group of diversity consultants conducted 10 live presentations for the laboratory's federal and contractor employees in early May. At DOE's Sandia National Laboratories, live presentations featured diversity messages from laboratory directors and videos focused on employee diversity experiences.

Employees who could not participate in the April 5 stand-down are required to complete make-up training. ❖

Secretary announces key personnel actions

On April 12, Secretary of Energy Bill Richardson announced his intention to assign Department of Energy officials in the areas of energy information, policy, public affairs, and economic impact and diversity.

"These officials have been doing excellent work for the Department and the nation," Secretary Richardson said. "I've asked them to take on different and, in some cases, additional responsibilities to help the Department continue to serve its missions."

Jay Hakes, who has served as Administrator of the Department's Energy Information Administration (EIA) since 1993, is leaving the Department in May 2000 to become Director of the Jimmy Carter Presidential Library in Atlanta, Ga. The EIA Administrator is a Presidential appointment, subject to Senate confirmation. **Mark Mazur**, Director, Office of Policy, will take on duties in EIA.

"Jay Hakes has done outstanding work in leading the Energy Information Administration. I have relied on him heavily for assistance as world oil prices have fluctuated over the last six months," Secretary Richardson said. "Because of my concern about the crucial work of the EIA, I have asked Mark Mazur to join that office and facilitate a smooth transition there."

Melanie Kenderdine has been named Acting Director, Office of Policy, in addition to her role as senior policy advisor to the Secretary for oil and gas. **Steve Crout**, senior advisor in the Office of Congressional Affairs, will be joining the Office of Policy as Associate Director.

Natalie Wymer, Deputy Director, Office of Public Affairs, replaces Brooke Anderson as Director of the office. Anderson left the Department in March 2000 to become Senior Director for Communications at the National Security Council. **Esther Aguilera** is now serving as Deputy Director for Small and Disadvantaged Business Utilization, Office of Economic Impact and Diversity. Most recently, she was advisor to Secretary Richardson for small and disadvantaged business utilization and minority affairs. ❖

Proposal expands compensation for sick nuclear weapons workers

On April 12, Secretary of Energy Bill Richardson announced an expanded Administration proposal to compensate more than 3,000 current and former workers with a broad range of work-related illnesses throughout the Department of Energy's nuclear weapons complex. The legislation, if enacted into law by Congress, would give lump sum financial benefits or a package of benefits, to include lost wages, medical expenses, and job retraining, to workers with illnesses caused from breathing particles of beryllium, workers with cancers caused by workplace radiation exposure, and specific groups of workers at the Department's Paducah, Ky., Portsmouth, Ohio, and Oak Ridge, Tenn. sites.

"We are moving forward to do the right thing by these workers," Secretary Richardson said. "The men and women who served our nation in the nuclear weapons industries of World War II and the Cold War labored under difficult and dangerous conditions with some of the most hazardous materials known to mankind. This is a fair and reasonable program. It will compensate workers and get them the help they have long deserved."

In July 1999, the Administration proposed to help current and former Department contractor workers who are ill because of exposure to beryllium at DOE nuclear facilities. At that time, President Clinton tasked the National Economic Council (NEC) to lead an interagency review focusing on whether other illnesses warranted inclusion in the program.

In November 1999, legislation was sent to Congress that proposed benefits for workers with illnesses related to beryllium exposure and for groups of workers at the Paducah Gaseous Diffusion Plant in Kentucky and Oak Ridge site in Tennessee. Following its eight-month review, the NEC recommended to President Clinton that the November 1999 legislative proposal be significantly expanded to include other illnesses.

Under the expanded proposal, workers with beryllium-related illnesses or radiation-related cancers would receive the same benefits, including full medical expenses, lost wages, and job retraining. Workers diagnosed with a beryllium-related pulmonary condition or a cancer caused by certain kinds of radiation exposure before the legislation passes may choose a $100,000 lump sum benefit or the compensation package. This applies to current and former Federal and contractor workers and workers of companies that manufactured beryllium for the U.S. Government. If adequate information is not available, the Department will assume workers were exposed to the highest amount of radiation associated with the tasks they performed.

Secretary Richardson and Assistant Secretary for Environment, Safety and Health David Michaels brief reporters on the proposed compensation program.

Lump sum benefits of $100,000 will be available to workers with specific types of cancer at the Department's three former gaseous diffusion plants and, upon Secretarial approval, to a group of workers at the Department's East Tennessee Technology Park in Oak Ridge who have illnesses an independent panel of physicians determines are caused by workplace exposures.

For current and former workers with illnesses not specifically addressed in the legislative proposal, the Department is establishing a workers' advocacy office to help them obtain state workers' compensation benefits. The office will report to the Assistant Secretary for Environment, Safety and Health and is scheduled to begin reviewing workers' claims on May 1, 2000.

Most of the workers who would benefit from this proposal have worked at the Department's Hanford Reservation (Wash.), Oak Ridge Reservation (Tenn.), Savannah River Site (S.C.), Nevada Test Site, Rocky Flats Environmental Technology Site (Colo.), Pantex Plant (Texas), Mound Plant (Ohio), Lawrence Livermore National Laboratory (Calif.), Los Alamos National Laboratory (N.M.), Fernald Environmental Management Project (Ohio), and the gaseous diffusion plants in Paducah, Ky.; Portsmouth, Ohio; and Oak Ridge, Tenn.

The program is estimated to cost $120 million annually over the first three years of full operation. The cost should decline to $80 million a year as the backlog of claims is reduced.

Additional information about the compensation proposal is available at **http://www.eh.doe.gov/benefits**. Assistance for current and former workers also is available at the toll-free Department of Energy Workers' Compensation Helpline, 877-447-9756. ❖

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Inside

On our cover

Researchers at the Department of Energy's Argonne National Laboratory have developed a new, ultrasensitive trace analysis technique that is able to detect single atoms in a large sample. The research team has been able to count individual atoms of the rare krypton-85 and krypton-81 isotopes in a sample of krypton gas.

Called Atom Trap Trace Analysis, or ATTA for short, the technique uses a table-top laser to slow, trap, and count atoms. In the device, a sample is directed into a one-meter-long tube where the atoms run into a laser beam shining directly at them. At the end of the tube is the trap, where six laser beams hold the atoms in place. In the photo, Chun-Yen Chen, Argonne post-doctoral appointee, uses an instrument that lets her see the invisible infrared laser beams in the ATTA device.

Although the researchers have only worked with krypton atoms so far, the technique should apply to some other isotopes as well. The technology could have applications in many fields, from solar-neutrino research to groundwater studies and environmental monitoring.

DOE This Month

U.S. DEPARTMENT OF ENERGY

APRIL/MAY 2000

Proposal expands worker illness compensation

Nation's oil reserve system completes modernization

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Argonne National Laboratory atom trace analysis technique